

## **REMARKS**

In view of the amendments to the claims and the following remarks, the Examiner is requested to allow claims 34, 45-52, 61, 62, 69, 77, 79 and 80, the only claims pending and under examination in this application.

## **FORMAL MATTERS:**

Claim 70 and its dependents have been canceled in this amendment. As such, claims 40, 53-60, 64, 66 and 70 have been cancelled in the present application. Likewise, claim 78 has been canceled.

Claims 34, 45, 52 and 79 have been amended to change their dependencies.

Claim 69 has been amended to remove the limitation that the GPCR has been associated with a disease or disorder. Claims 63 and 65 have been canceled to be consistent with this amendment. Claim 69 also has been amended to specify that the GPCR comprises a mutation in its amino acid sequence so as to render it constitutively active. Step (a) has been deleted as being redundant to this amendment. Support for this amendment can be found throughout the specification, e.g., on page 5, lines 10-14 and lines 27-30; page 31, line 22 to page 32 line 4; and page 35 lines 19-21.

Claim 77 has been amended to remove the word "candidate" in line 1 of the claim.

Claim 80 has been added and specifies that the GPCR in claim 77 comprises a mutation in its amino acid sequence so as to render it constitutively active. Support for this amendment is the same as for the similar amendment to claim 69.

As no new matter is added by these amendments, entry by the Examiner is respectfully requested.

## **INTERVIEW OF DECEMBER 10, 2007**

Applicants would like to thank Examiners Howard and Kemmerer for discussing this application and providing helpful comments during the interview on December 10, 2007. Based on the discussion of the instant application in the interview, Applicants have amended the claims herein and provide arguments supporting the utility of the claimed invention. Applicants respectfully submit that the claims are in condition for allowance.

**REJECTIONS UNDER §101, UTILITY**

Claims 34, 40, 45-66, 69 and 70 stand rejected under 35 U.S.C. §101 as lacking patentable utility.

During the interview of December 10, 2007, Applicants discussed the significance of the instant invention and the concept of "pioneering inventions" in biotechnology, particularly as pioneering inventions contrast with mere "technological improvements." Pioneering inventions have long been recognized by the courts as inventions "...of such novelty and importance as to make a distinct step in the progress of the art, as distinguished from a mere improvement or perfection of what had gone before," *Westinghouse v. Boyden Power Brake Co.*, 170 U.S. 537, 562 (1898). Technological improvements, on the other hand, are those inventions that merely improve or perfect what had gone before. When reviewing an application for a technological improvement, the onus is on the Examiner to limit the invention to the mere improvement being disclosed with the understanding that the contribution to the public is of a limited and specific nature. In contrast, when examining a pioneering invention, it is critical that the Examiner judge the invention in light of the disclosure and the existing art as of the time of the invention. Pioneering inventions, once disclosed, create the opportunity for technological improvements and "follow-on" inventions by others. Constraining a pioneering invention too narrowly unfairly limits the applicant to less than that disclosed and minimizes the reward for innovation.

At the time the instant application was filed, the significance of GPCRs was well-established and many GPCRs had been identified. However, the prevailing understanding was that GPCRs were effectively useless if their endogenous ligands were not known (i.e., orphan GPCRs). Identifying ligands is a laborious process that soon became the rate-limiting step for progress in the field of orphan GPCRs.

The instant application opened the way to an entirely new method of screening for candidate compounds of GPCRs for which no known ligand exists (i.e., orphan GPCRs). This discovery is a distinct step in the progress of the art, successfully reversing the thinking at that time that successful candidate compound screening of orphan GPCRs was not possible until a ligand for the GPCR had been discovered. Accordingly, the instant invention represents something of a paradigm shift. Applicants believe that the instant application represents a pioneering invention and respectfully request that the Examiner keep this in mind in light of the following examples and additional arguments herein.

Applicants described the pioneering aspect of this invention in the specification at the time of filing. For example, the specification states:

In modern molecular biology, important advances have frequently occurred when an individual stepped outside of the traditionally accepted way of viewing things and examined a situation afresh from a new perspective. Typically, when such circumstances have occurred, all the information with which to deduce the insight has been present, but has been unappreciated except by that particular person. Two prominent examples of this phenomenon are the discoveries of the reverse information flow from RNA to DNA and the technique of DNA amplification known as PCR. ... This invention disclosed in this patent document arises from just such a unique shift in perspective.  
*(page 28, line 29 to page 29, line 12)*

The specification goes on to characterize the invention, stating "Essentially, the method of this invention provides a means for discovering modulators of receptor function without the need for any knowledge of the endogenous ligand. This ability is without counterpart in the prior art." (page 31, lines 15-17). The specification further characterizes the pioneering aspect of the invention, saying "This ability creates a whole new paradigm for drug discovery." (page 35, lines 2-3). Consistent with the excitement surrounding this invention, its significance was quickly recognized by others in the biotechnology and venture capital communities (see press releases attached to the previous Response).

The comparison of the Applicants' invention to PCR extends beyond their similarities as paradigm shifting inventions. The utility of PCR is not derived from the identity of the polynucleotide being amplified, but rather from its ability to amplify virtually any polynucleotide of interest to a user, regardless of its specific sequence or function. In the interview of December 10, 2007, Applicants noted that the utility of Applicants' claimed invention is derived not from the identity of the GPCR employed in the method, but rather from the ability of one to employ the claimed methods to identify modulating compounds for virtually any GPCR that is of interest. In this sense, the utility of the claimed methods is akin to that of the PCR. As such, a user of the claimed invention of the instant application comes to the table with a GPCR of interest for which candidate modulatory compounds are sought. The sequence and function of the GPCR and why the GPCR is of interest to the user of the instant screening method is immaterial to the patentable utility of the subject invention, just as the sequence and function of the polynucleotide used for PCR and why the polynucleotide being amplified is of interest to the user is immaterial to the utility of PCR.

An example from the GPCR screening field of patented claims that are not limited to a particular GPCR can be found in U.S. Patent No. 5,462,856 (provided herein as Exhibit A). The '856 patent,

entitled "Methods for identifying chemicals that act as agonists or antagonists for receptors and other proteins involved in signal transduction via pathways that utilize G-proteins," discloses a pioneering invention wherein the aggregation or dispersion of pigment in melanophore cells is used as a read-out for whether a candidate compound is an agonist or antagonist of a GPCR. None of the issued claims are limited to a particular GPCR, as knowledge of the sequence or function of the screened GPCR is not necessary to the screening method. Accordingly, the claimed screening method does not recite why a particular GPCR is of interest to the user. The '856 patent, like the subject invention, discloses a screening method that can be used with virtually any GPCR of interest.

In sum, Applicants believe the subject invention is a pioneering invention which discloses a method for screening orphan GPCRs where, by definition, a ligand for the receptor is not known. Applicants have disclosed that, by constitutively activating the orphan receptor, screening can be accomplished in the absence of a ligand. The claimed method should not be limited to a particular orphan GPCR because the method can be used with any constitutively activated GPCR.

Based on the discussion above, Applicants respectfully submit that the claimed invention has a significant and presently available useful benefit to the public. Applicants respectfully request withdrawal of this rejection under 35 U.S.C. §101.

#### **REJECTIONS UNDER §112, ¶1 (ENABLEMENT)**

Claims 34, 40 and 45-66, 69 and 70 stand rejected as not meeting the "how to use" part of the enablement requirement of 35 U.S.C. § 112, first paragraph.

The basis for this rejection is the Examiner's contention that the claims are not supported by a patentable utility.

As such, it is believed that this rejection has been adequately addressed in the discussion in the preceding section of this response.

In view of the discussion in the preceding section of this response, Applicants respectfully request withdrawal of this rejection.

**REJECTIONS UNDER §112, ¶1 (WRITTEN DESCRIPTION)**

Claims 34, 40 and 45-66, 69 and 70 stand rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement.

Specifically, the Examiner asserts that the "the specification fails to provide sufficient descriptive information of any orphan GPCRs that are associated with a disease or disorder."

Applicants have amended the claims to remove the recitation that the GPCR of interest is associated with a disease or disorder. As such, Applicants contend that this rejection is moot and respectfully request its withdrawal.

**CONCLUSION**

Applicants submit that the pending claims are in condition for Allowance, which action is requested. If the Examiner finds that a telephone conference would expedite the prosecution of this application, he is invited to telephone the undersigned at the number provided.

The Commissioner is hereby authorized to charge any underpayment of fees associated with this communication, including any necessary fees for extensions of time, or credit any overpayment to Deposit Account No. 50-0815, order number AREN-001CIP.

Respectfully submitted,  
BOZICEVIC, FIELD & FRANCIS LLP

Date: January 30, 2008

By: /David C. Scherer, Reg. No. 56,993/  
David C. Scherer, Ph.D.  
Registration No. 56,993

BOZICEVIC, FIELD & FRANCIS LLP  
1900 University Avenue, Suite 200  
East Palo Alto, California 94303  
Telephone: (650) 327-3400  
Facsimile: (650) 327-3231

Enclosures: Exhibit A (U.S. Patent 5,462,856)